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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: PACE MICRO TECHNOLOGY PLC )  
)  
Application No.: 09/808,821 )  
)  
Filing Date: 03/15/01 )  
)  
For: CONTROL SYSTEM FOR NETWORK )  
SERVERS )  
)  
Art Unit: UNKNOWN )

(2)

TRANSMITTAL OF PRIORITY DOCUMENT

Director for Patents and Trademarks  
Washington, D.C. 20231

Dear Sir:

Enclosed herewith is a certified copy of British Patent Application No. 0006097.0  
for which the above-identified patent application claims priority from.


If, for any reason, this priority document is not acceptable, please inform the  
undersigned as soon as possible.

Respectfully Submitted

HEAD, JOHNSON & KACHIGIAN

Date: 04/04/01

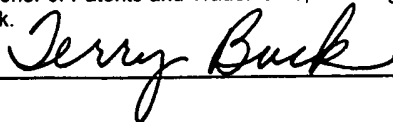
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Date of Deposit: April 4, 2001

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The Patent Office  
Concept House  
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Newport  
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I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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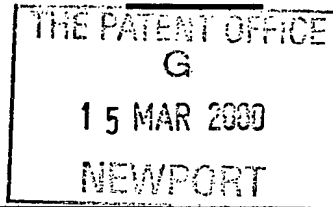
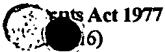
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Dated

20 March 2001

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F01/7700 0.00-0006097.0  
The Patent Office

Cardiff Road  
Newport  
Gwent NP9 1RH

# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1.	Your reference	GW-G29485			
2.	Patent application number (The Patent Office will fill in this part)	0006097.0 15 MAR 2000			
3.	Full name, address and postcode of the or of each applicant (underline all surnames)	Pace Micro Technology Plc  Victoria Road Saltaire Shipley BD18 3LF  U.K. 7588569001 df			
	Patents ADP number (if you know it)				
	If the applicant is a corporate body, give the country/state of its incorporation				
4.	Title of the invention	Control System for Network Servers			
5.	Name of your agent (if you have one)	Bailey Walsh & Co.			
	"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	5, York Place Leeds LS1 2SD			
	Patents ADP number (if you know it)	224001			
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	<table border="0"> <tr> <th>Country</th> <th>Priority application number (if you know it)</th> <th>Date of filing (day / month / years)</th> </tr> </table>	Country	Priority application number (if you know it)	Date of filing (day / month / years)
Country	Priority application number (if you know it)	Date of filing (day / month / years)			
7.	If this application is divided or otherwise derived from an earlier UK application, the earlier application	<table border="0"> <tr> <th>Number of earlier application</th> <th>Date of filing (day / month / years)</th> </tr> </table>	Number of earlier application	Date of filing (day / month / years)	
Number of earlier application	Date of filing (day / month / years)				
8.	Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer "Yes" if:	Yes			
	a) any applicant named in part 3 is not an inventor, or				
	b) there is an inventor who is not named as an applicant, or				
	c) any named applicant is a corporate body				
	See note (d)				

# Patents Form 1/77

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Continuation sheets of this form

Description 6

Claim(s)

Abstract

Drawing(s)

1 + 1 

10. If you are also filing any of the following, state how many of each item.

Priority Documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(Please specify)

11. I/We request the grant of a patent on the basis of this application

Signature



Date

14.03.00

12. Name and daytime telephone number of person to contact in the United Kingdom

G Wood  
0113 2433824

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## Control System for Network Servers

The invention to which this application relates is to improvements in a control system for a series of servers which are provided as part of a server network provided particularly, but not necessarily exclusively, to supply information to electrical apparatus which is required by said apparatus to receive same.

In one example, there is typically provided an electronic information supply network which provides information and data to a plurality of electrical apparatus such as a series of broadcast data receivers. These broadcast data receivers are provided to allow data which is broadcast from a remote location to be decoded and processed into video, audio and/or text which is displayed on a display screen, such as that of a television set, to a user of the apparatus in a premises. The receivers are required to be configured in a particular manner in order to allow the same to operate in a uniform manner and to be able to process the data which is received from the remote locations. There is also a need for the receiver configuration to be updated from time to time.

In order to allow the configuration of the receivers to be controlled, information is provided and transmitted to the same via communication network which utilises what is known as a Dynamic Host Configuration Protocol (DHCP). The network typically includes a plurality of servers which supply the configuration information to the receivers via the network. In practice, if there are a number of servers in the network issuing the configuration information and one, or more, of the servers is issuing information which is incorrect, one of the other servers can indicate to the receiver that the data received from a specified server is invalid and should be discarded. In response to that, the receiver deletes the configuration which has been set up on the basis of the information

received and reattempts to obtain the configuration information from the network, but it is likely that the same server which is emitting the incorrect information is accessed and so the system goes into a loop condition in which the receiver continues to obtain incorrect information, deletes the same and then starts again.

The aim of the present invention is to provide a network system whereby if a server introducing information onto the network is found to be introducing incorrect information the same is disregarded.

In a first aspect of the invention there is provided a system for the generation and transmitting of data to a number of items of electrical apparatus, said system comprising a network to which a number of servers are connected, said servers controlled to issue data for distribution through the network to the number of items of electrical apparatus and, on the basis of the data, said electrical items adopt an operating configuration and characterised in that said system further includes a memory means which is adapted to identify when incorrect data is issued by a server and identify the server from which the said data issued.

In one embodiment each of the items of electrical apparatus is a broadcast data receiver which is provided for the reception of data which is broadcast from a remote location, and for the processing of said data to generate audio video and/or text.

In a preferred embodiment each of the receivers is provided with a memory means in accordance with the invention. When data is received from the network and a signal is sent to the receiver to indicate that the data received is incorrect the data is deleted and the configuration of the receiver changed back. However in accordance with the invention an additional step is undertaken



inasmuch that the details of the server which issued the incorrect data to the network and hence receiver is stored in that receiver memory means. Thus, when the receiver again searches for the required data from the network, if it is offered data from a server which is identified in the memory means the receiver declines to accept the data and searches for the data from another of the servers. This therefore ensures that the receiver obtains data from the network which is correct and as a result the configuration of the receiver is correct.

In a further feature of the invention, if one of the receivers identifies that the data received is incorrect and the server is identified, a signal is transmitted around the network such that memory means in each of the receivers has data which identifies the server and so subsequently each of the receivers refuses to accept the data from the identified server or servers.

It is envisaged that a server which issues incorrect data will in due course be corrected and when this occurs a "clear" signal can be generated to the receivers to clear the server details from the memory means so that the receivers will once more accept data from the server. However it is envisaged that until the clear signal is received the memory means will act as a historical record of the server or servers from which data should not be accepted.

A specific embodiment of the invention is now described with reference to the accompanying drawing, wherein:-

The network 2 comprises a number of servers S1, S2, S3 and each of the servers can be controlled to issue what should be the same data into the network. The network also includes a number of broadcast data receivers r1, r2, r3, r4, r5, r6, rn. to which the data from the servers is intended. Thus at any one time, each of the servers can be

providing data to one of the receivers and those receivers which require the data will be electronically searching the network for a free server. The data which is received can be used to configure and/or alter the configuration of the receiver apparatus.

For example, when a receiver uses the standard DHCP protocol (RFC2131 and RFC2132) to establish its IP address and other network configuration information, the receiver broadcasts what are known as DHCPDISCOVER messages. The DHCP client software which runs on the receiver collects the DHCPOFFER messages which are issued by available servers. The DHCP software control on the receiver selects one of the available servers and makes the selection on the basis of a number of criteria which can be predetermined in accordance with system requirements and sends to the selected receiver a DHCPREQUEST message. The chosen server then responds with a DHCPACK signal and the communication between the server and receiver is completed.

If one of the other servers in the network believes that the chosen server has issued data which is incorrect then it sends to the receiver a DHCPNAK signal to indicate that the receiver should disregard the data received from the chosen server and return to broadcasting the DHCPDISCOVER message. Conventionally when the receiver retries it is highly likely that the same sequence of events will occur and that the receiver will again choose the incorrect receiver as the criteria used for selection remain unchanged from when the initial choice was made. This means that the receiver is likely to once more receive incorrect data, another server will issue a DHCPNAK signal and so the loop starts again and the receiver is never configured correctly.

However in accordance with the invention a new criteria is introduced which is the analysis of whether the DHCPOFFER

message which is issued to the receiver, is issued by a server which has already been chosen by the receiver on a previous attempt, which details are held in memory means and for which received data a DCHPNAK signal was received by the receiver from another server. This analysis avoids the receiver from accepting the new DCHPOFFER signal from the server which is emitting the incorrect data and leads to the receiver accepting the data from another server which has issued the DCHPOFFER signal.

It is possible that in practice the next accepted server may also provide incorrect data and if this is the case the newly selected server will be added to the memory means and the process of seeking and selecting a server is repeated with on this occasion two of the servers being declined.

Thus in practical terms if the network has "n" servers and of these a number "f" are issuing incorrect data, the receiver will require, at worst "f+1" attempts to identify and receive data issued by an acceptable server whereas previously the number of attempts was unbounded as the receiver could continue to use the same server and receive incorrect data each time.

A practical example is that a DHCP receiver requites configuration data from the network and receives two responses, from server s1 and server s2. The receiver chooses the offer from s1 and is issued an IP address by s1. However s2 notices that the IP address which s1 has offered lies within the range of addresses which is administered exclusively by s2. s2 tells the receiver to ignore the information from s1 and the receiver remembers from the memory means that the information from s1 was bad and restarts. On the next attempt the receiver receives offers from both s1 and s2 again but prefers the offer from s2 because it remembers that s1 issued faulty information the previous time.

In accordance with the invention if all of the servers are issuing incorrect data or a signal is received to indicate that a previously faulty server has been fixed, the receiver will clear the whole memory means of faulty servers or clear selected servers as appropriate.

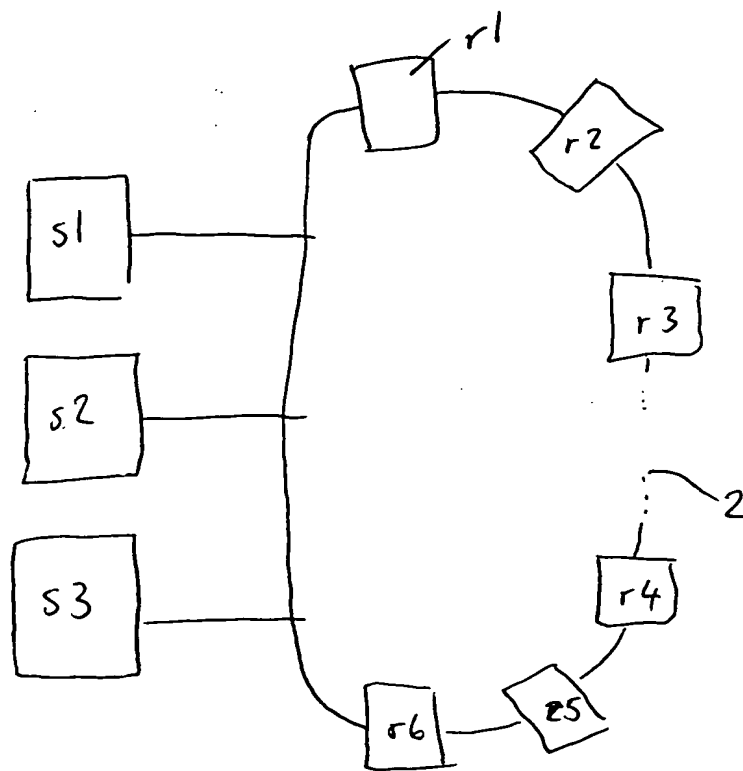


Figure 1

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